ORNITHOLOGICAL LITERATURE[1]

SYSTEMATICS AND THE ORIGIN OF SPECIES, FROM THE VIEWPOINT OF A ZOOLOGIST. By Ernst Mayr. Columbia University Press, New York, 1942: 9 x 6 inches, xiv + 334 pp.; 29 figs. $4.00.

This outstanding book is based on the Jesup lectures delivered at Columbia University in March, 1941, and commences with an introduction by Dobzhansky, a geneticist noted for his interest in speciation and geographical variation.

The avowed purpose of the book is to outline the change from the old "static" species concept to the "dynamic" species concept of the modern systematist. The great significance of the polytypic species and the role of geographic variation in evolution are not properly appreciated by biologists or even by taxonomists, and Mayr undertakes to expound their importance and, by inference, their fascination.

The first two chapters are an excellent exposition of elementary taxonomic procedure. The next two are an equally interesting treatment of the phenomena and aspects of geographical variation. The fifth is perhaps the most controversial, since it deals with the "new," "dynamic" or "biological" species concept. This leads naturally to a discussion of the polytypic species, the helpful concept of the superspecies, and the important distinctions between allopatric and sympatric species (excellent terms, criticizable only on the grounds of etymological hybridity). The proof of geographic speciation is excellent, and the value of the superspecies concept in this connection is fully brought out. The systematist must remember that geographic speciation has been constantly denied.

Two summary definitions are worth quoting. In Mayr's view "species are groups of actually or potentially interbreeding natural populations, which are *reproductively isolated* from other such groups." "A new species develops if a population which has become geographically isolated from its parental species acquires during this period of isolation characters which promote or guarantee reproductive isolation when the external barriers break down." I hope that these definitions will arouse the interest and curiosity of readers, who will then read the book to discover their validity.

A chapter on non-geographic speciation is quite brief, since this is still a very controversial field. The ecological race, the sibling species, and the biological race are concepts which should particularly interest American ornithologists, for they define a field which is still "wide-open" with many common North American birds. They should read Mayr's discussion of the malarial mosquitos of southern Europe, where most of the species and races cannot be told apart as museum specimens!

Every chapter is replete with a wealth of illustration. Most of the cases are ornithological, and the author naturally prefers examples from Melanesia and Polynesia, on whose birds he is the world's authority. But he does not hesitate to give case histories in other groups of animals, and displays a breadth of knowledge of animals, genetics, and the literature of systematics which arouses admiration and respect, especially when we recall that he is not writing in his native language. There is more tolerance, less over-positive statement, than in his earlier writings. On a few occasions he boldly criticizes monographic studies in groups of animals other than birds, and revises the authors' conclusions to suit his own ideas; he has already been challenged at least twice.

The final chapter discusses the higher categories of classification, and is a sane and practical approach to the concepts of genus and family. Here and there are very courteous references to the A. O. U. check-list as "rather conservative," and suggestions as to the unnecessary number of genera and species, with most of which the reviewer is in hearty accord.

Mayr's book is the most comprehensive treatment in English of the new science

[1] For additional reviews see pages 87 and 125.

of speciation. Interestingly and clearly written, it arouses thought and reflection, and one returns to reread an earlier chapter. This review, at least, has not been dashed off. The reviewer is definitely a disciple of the new species concept; he is a systematist who has believed for years in the importance of the polytypic species and the role of geographic variation in the evolution of new species; he has deplored the lack of understanding in geneticists and experimental biologists.

What will this able book accomplish? First and foremost, it should help systematists to be better systematists, to abandon purely mind-made systems of putting animals into a series of cubbyholes of different sizes. The general biologist should be impressed with the weight of evidence which a competent expert like Mayr can martial for the importance of geographic variation. Some may complain that their pet group of animals has been neglected. Others will feel that experimental research has been slighted; it happens to be particularly difficult or impossible with birds. Others again may say that they still do not know how new species are evolved; our author does not claim to settle it. There is one difficulty inherent in systematics, as Mayr, I feel sure would be the first to admit. Systematics is a subjective field in two respects: (1) No written words and charts can take the place of knowledge in the field of the birds themselves or of the study of museum series. (2) On Mayr's own definition of a species, the impossibility of proof by experiment reduces the test of reproductive isolation to a question of individual judgment and authority rather than of fact. If systematists would only accept and face these two handicaps, their work would receive more consideration from other biologists and inspire more respect and less irritation from amateurs.—Ludlow Griscom.

Wildlife Refuges. By Ira N. Gabrielson. MacMillan, New York, 1943: 6 x 9¼ in., xiii + 257 pp., 32 pls., 17 figs. $4.00.

Wildlife conservation has come a long way since the time when restrictions on the kill were considered the complete solution. As a part of this development, the function of refuges has changed from that of saving individuals to one as much concerned with saving and managing habitats so that more individuals can be produced and supported by the land. A number of attendant values, as well as an appreciation of the limitations, of refuges have also come to be better understood. Examples of the former are contributions to flood- and erosion-control and supplying seasonal work and recreation to the people living nearby; of the latter, competition between different species on the same refuge, and destruction of habitats if refuges are allowed to become over-crowded. Methods of developing and handling refuges have also been more thoroughly worked out.

The first fifth of "Wildlife Refuges" expands these ideas under the headings: history, purposes, values and limitations, types, and management of refuges; about three-fifths deals with the refuges administered by the Fish and Wildlife Service; other federal, state, and private refuges in this country, Canadian and Mexican refuges, a bibliography, and an index make up the rest of the book. Although waterfowl are stressed, there is much that pertains to big game, upland game birds, non-game birds, and fur-bearers.

As Director of the Fish and Wildlife Service, Gabrielson has an unusually detailed knowledge of the whole refuge movement. This, coupled with his ability as a biologist, gives his judgments an authority which few others could claim. His examples of land treatments, and of the solution of disagreements between cooperating agencies, give one a better understanding of the actual mechanics of refuge development, and serve as the best sort of precepts.

Gabrielson's enthusiasm for the necessity and effectiveness of the work of his Service has caused that work to be better and sooner done; if carried over too extensively into his writing, however, this spirit may hinder his readers in appraising the results of the refuge program. There is some evidence that this may have